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Advancing the Arizona State University Knowledge Enterprise

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Methods to prevent repetitive strain injuries in endoscopists

Repetitive strain injury (RSI), associated with repetitive physical activities in the workplace, is a common injury for endoscopists. RSI can not only lead to long term disability, resulting in an inability to work, but it could potentially lead to impaired sensorimotor function and loss of dexterity in endoscopy maneuvers, which could result in injury to the patient. The prevalence of musculoskeletal overuse symptoms in endoscopists is estimated to range from 37% to 89%. The ability to train an endoscopist in ergonomically correct and safe upper limb movements could help prevent RSI associated with long-term endoscopy procedures.

Researchers at Arizona State University have developed a novel feedback system for training endoscopists to use proper upper limb maneuvers that don't strain joints or muscles. This system warns an operator when they approach the extremes of joint range of motion in order to promote better movement patterns. This technology can benefit not only endoscopists, but also patients and the healthcare system as a whole; RSIs may be minimized and, digit/finger sensation maintained thus keeping the patient safe; and the costs associated with treating RSI are reduced.

This system has the potential to change how endoscopists learn safe and effective techniques and may also be applied to other procedures including laparoscopy and other occupations prone to overuse injuries.

Potential Applications

- Prevention of repetitive strain injury in endoscopists
- Prevention of repetitive strain injury in other occupations prone to overuse injuries

Benefits and Advantages

- Provides real-time feedback and warnings on upper limb movement patterns and performance/strain during simulated endoscopic procedures
- Helps the user train in proper and ergonomically safe movements which do not strain joints and muscles
- Simple to use
- Can replay the procedure to allow the user to see which positions/movements tend to induce more strain

For more information about the inventor(s) and their research, please see Dr. Santello's departmental webpage